

Amendments to the Claims

This listing of the claims replaces all prior versions and listing of the claims in the present application.

Listing of Claims

1-16. (canceled)

17. (currently amended) A structured document processing system comprising:

a network composed of a server device and a plurality of client devices,

the server device storing a structured document composed of a plurality of nodes which are hierarchically organized in a tree structure, wherein each of the nodes is a constituent unit of the structured document and has a node tree structure having a tag node as its top node, wherein predetermined ones of the tag node are provided with a transfer object flag, and wherein each of the client devices stores a duplication of the structured document,

the server device comprising,

an update manager for managing an update of the structured document using only a single updated minimum element which is a tree-structured portion of the structured document, wherein a top node of the single updated minimum element is provided with the transfer object flag, wherein the single updated minimum element has a minimum node tree structure, includes a plurality of

updated portions of the structured document, and is determined by referring to its transfer object flag, and

a transmission section that identifies for transmission the single updated minimum element based on a location of the transfer object flag within the tree structure and transmits the identified single updated minimum element to one of the client devices,

wherein each of the client devices completes the update with only a single replacement operation of replacing ~~replaces~~ a corresponding tree-structured minimum element of the structured document currently stored in the client device with the identified single updated tree-structured minimum element received from the server device.

18. (previously presented) The structured document processing system according to claim 17, wherein the update manager instructs the transmission section to transmit the single updated minimum element of the structured document when the structured document has been updated.

19. (previously presented) The structured document processing system according to claim 17, wherein the update manager instructs the transmission section to transmit update information to one of the client devices when the structured document has been updated, the update information including identification information identifying the single updated minimum element of the structured document.

20. (original) The structured document processing system according to claim 17, wherein the update manager manages the update of the structured document using an update time at which the update of the structured document occurs,

wherein, when an update occurs at the node, the update manager instructing the transmission section to transmit update information to a client device, the update information including the update time.

21. (original) The structured document processing system according to claim 20, wherein, when a client device receives the update information from the server device, the client device updates the structured document stored therein based on the update information received.

22. (original) The structured document processing system according to claim 21, wherein each of the client devices comprises:

a comparator for comparing the update time of the update information received is later than an updated time of the structured document currently stored therein; and

a transmission controller for requesting transfer of an updated minimum element of the structured document when the update time of the update information received is later than the updated time of the structured document currently stored therein.

23. (previously presented) The structured document processing system according to claim 17, wherein the update

manager transmits the single updated minimum element of the structured document to a client device at a plurality of predetermined times.

24. (previously presented) The structured document processing system according to claim 17, wherein the update manager transmits update information to the client device at a plurality of predetermined times, the update information including identification information identifying the single updated minimum element of the structured document.

25. (original) The structured document processing system according to claim 24, wherein the update manager manages the update of the structured document using an update time at which the update of the structured document occurs, the update information further includes the update time.

26. (original) The structured document processing system according to claim 17, further comprising:

a gateway server device performing protocol processing between the server device and each of the client devices,

wherein the server device transmits update information indicating that the structured document is updated to the gateway server device,

wherein the gateway server device comprises:

an structured document manager for managing the duplication of the structured document stored in the client device;

an update information receiver for receiving update information from the server device; and

an update controller for transmitting the update information received from the server device to the client device.

27. (original) The structured document processing system according to claim 26, wherein the update controller transmits the update information received from the server device to the client device at a plurality of predetermined times.

28. (original) The structured document processing system according to claim 26, wherein, when a client device receives the update information from the gateway server device, the client device updates the duplication of the structured document stored therein based on the update information received.

29. (previously presented) The structured document processing system according to claim 28, wherein each of the client devices comprises:

a comparator for comparing the update time of the update information received is later than an updated time of the structured document currently stored therein; and

a transmission controller for requesting transfer of the single updated minimum element of the structured document when the update time of the update information received is later than the updated time of the structured document currently stored therein.

30. (previously presented) The structured document processing system according to claim 17, further comprising:

a gateway server device performing protocol processing between the server device and each of the client devices,

wherein the server device transmits update information including an update time and the single updated minimum element to the gateway server device,

wherein the gateway server device comprises:

an structured document storage for storing the duplication of the structured document stored in the client device;

an structured document manager for managing the duplication of the structured document for the client device and an update time thereof;

an update information receiver for receiving the update information from the server device; and

an update controller for transmitting the updated minimum element of the structured document to a client device having the update time of the structured document stored therein, which is later than the update time included in the update information received from the server device.

31-46. (canceled)

47. (currently amended) A structured document updating method in a network composed of a server device and a plurality of client devices, the server device storing a structured document composed of a plurality of nodes which are

hierarchically organized in a tree structure, wherein each of the nodes is a constituent unit of the structured document and has a node tree structure having a tag node as its top node, wherein predetermined ones of the tag node are provided with a transfer object flag, and wherein each of the client devices stores a duplication of the structured document, the method comprising the steps of:

at the server device,

a) managing an update of the structured document composed of the plurality of nodes which are hierarchically organized in the tree structure using only a single updated minimum element which is a tree-structure portion of the structured document, wherein a top node of the single updated minimum element is provided with the transfer object flag, wherein the single updated minimum element has a minimum node tree structure, includes a plurality of updated portions of the structured document, and is determined by referring to its transfer object flag; and

b) identifying for transmission the single updated minimum element based on a location of the transfer object flag within the tree structure and transmitting the identified single updated minimum element to the client devices, and

at a client device receiving the identified single updated minimum element,

c) completing the update with only a single replacement operation of replacing a corresponding tree-structured minimum

element of the structured document currently stored in the client device with the identified single updated tree-structured minimum element received from the server device.

48-50. (canceled)

51. (previously presented) The structured document updating method according to claim 47, wherein the step (b) includes transmitting update time information and the step (c) comprises the steps of:

when the update time of the update time information received is later than an updated time of the structured document currently stored therein, requesting transfer of the single updated minimum element of the structured document.

52. (previously presented) The structured document updating method according to claim 47, wherein the single updated minimum element is transmitted to the client devices at a plurality of predetermined times.

53. (previously presented) The structured document updating method according to claim 47, wherein update information is transmitted to the client devices at a plurality of predetermined times, the update information including identification information identifying the single updated minimum element.

54. (canceled)

55. (previously presented) The structured document updating method according to claim 47, wherein the network further

comprises a gateway server device performing protocol processing between the server device and each of the client devices,

the method further comprising the steps of:

at the gateway server device,

d) managing the structured document stored in each of the client devices;

e) receiving an update information from the server device;
and

f) transmitting the update information received from the server device to a client device.

56. (previously presented) The structured document updating method according to claim 55, wherein in the step (f), the update information received from the server device is transmitted to the client device at a plurality of predetermined times.

57. (canceled)

58. (previously presented) The structured document updating system according to claim 56, wherein the step (b) includes transmitting update time information, and further comprising the steps of:

at the client device,

when the update time of the update time information received is later than an updated time of the structured document currently stored therein, using the identification information to request transfer of the single updated minimum element from the gateway server device.

59. (previously presented) The structured document updating system according to claim 47, wherein the network further comprises a gateway server device performing protocol processing between the server device and each of the client devices,

the method further comprising the steps of:

at the gateway server device,

storing the structured document stored in each of the client devices in an information storage;

managing the structured document for each of the client devices and an update time thereof;

receiving an update information from the server device at which an update of the structured document occurs;

selecting a client device having the update time of the structured document stored therein, which is later than the update time included in the update information received from the server device; and

transmitting the single updated minimum element identified by the identification information included in the update information received from the server device, to the selected client device.

60. (canceled)

61. (currently amended) A storage medium storing a computer program for updating a structured document in a network composed of a server device and a plurality of client devices, the server device storing a structured document composed of a plurality of

nodes which are hierarchically organized in a tree structure, wherein each of the nodes is a constituent unit of the structured document and has a node tree structure having a tag node as its top node, wherein predetermined ones of the tag node are provided with a transfer object flag, and wherein each of the client devices stores a duplication of the structured document, the computer program at the server device, comprising the steps of:

a) managing an update of the structured document composed of the plurality of nodes which are hierarchically organized in the tree structure using only a single updated minimum element which is a tree-structure portion of the structured document, wherein a top node of the single updated minimum element is provided with the transfer object flag, wherein the single updated minimum element has a minimum node tree structure, includes a plurality of updated portions of the structured document, and is determined by referring to its transfer object flag; and

b) identifying for transmission the single updated minimum element based on a location of the transfer object flag within the tree structure and transmitting the identified single updated minimum element to the client devices,

wherein each of the client devices completes the update with only a single replacement operation of replacing ~~replaces~~ a corresponding tree-structured minimum element of the structured document currently stored in the client device with the

identified single updated tree-structured minimum element received from the server device.

62. (currently amended) A server device in a structured document processing system comprising a plurality of client devices,

the server device storing a structured document composed of a plurality of nodes which are hierarchically organized in a tree structure, wherein each of the nodes is a constituent unit of the structured document and has a node tree structure having a tag node as its top node, wherein predetermined ones of the tag node are provided with a transfer object flag, and wherein each of the client devices stores a duplication of the structured document,

the server device comprising,

an update manager for managing an update of the structured document using only a single updated minimum element which is a tree-structured portion of the structured document, wherein a top node of the single updated minimum element is provided with the transfer object flag, wherein the single updated minimum element has a minimum node tree structure, includes a plurality of updated portions of the structured document, and is determined by referring to its transfer object flag, and

a transmission section that identifies for transmission the single updated minimum element based on a location of the transfer object flag within the tree structure and transmits the identified single updated minimum element to the client devices,

wherein each of the client devices completes the update with only a single replacement operation of replacing ~~replaces~~ a corresponding tree-structured minimum element of the structured document currently stored in the client device with the identified single updated tree-structured minimum element received from the server device.

63. (currently amended) A client device in a structured document processing system comprising a server device that stores a structured document composed of a plurality of nodes which are hierarchically organized in a tree structure, wherein each of the nodes is a constituent unit of the structured document and has a node tree structure having a tag node as its top node, wherein predetermined ones of the tag node are provided with a transfer object flag, and wherein the client device stores a duplication of the structured document,

wherein the server device manages an update of the structured document using only a single updated minimum element which is a tree-structured portion of the structured document, wherein a top node of the single updated minimum element is provided with the transfer object flag and update time information, wherein the single updated minimum element has a minimum node tree structure, includes a plurality of updated portions of the structured document, and is determined by referring to its transfer object flag, and

wherein the server device identifies for transmission the single updated minimum element based on a location of the transfer object flag within the tree structure and transmits the identified single updated minimum element and its update time information to the client device,

wherein each of the client devices completes the update with only a single replacement operation of replacing ~~replaces~~ a corresponding tree-structured minimum element of the structured document currently stored in the client device with the identified single updated tree-structured minimum element received from the server device,

the client device comprising,

a comparator for comparing the update time of the update time information received from the server device and a last update time of the structured document currently stored therein to determine whether the update time of the update time information is later than the last update time; and

a transmission controller for requesting transfer of the single updated minimum element of the structured document when the update time of the update time information received is later than the updated time.